CLAIMS

What is claimed is:

1. A package for an electro-optic device, comprising:

a substrate having an upper surface;

an electro-optic device mounted over the upper surface of the substrate, the electro-optic device having a first optical port and a second optical port; and

a cap that forms a hermetic seal around the electro-optic device, the cap comprising:

a first window positioned to allow optical coupling between outside of the cap and the first optical port; and

a second window positioned to allow optical coupling between outside of the cap and the second optical port.

2. The package of claim 1, further comprising:

a first optical fiber mounted over the upper surface of the substrate at a first end; and

a second optical fiber mounted over the upper surface of the substrate and an opposing second end.

3. The package of claim 1, further comprising:

a first lens mounted over the upper surface of the substrate and in optical communication with the first optical fiber; and

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a second lens mounted over the upper surface of the substrate and in optical communication with the second optical fiber.

4. The package of claim 1, wherein the cap is mounted directly on the upper surface of the substrate.

5. The package of claim 1, further comprising:

a mounting plate on the upper surface of the substrate, wherein the cap is attached to the mounting plate.

6. The package of claim 1, wherein at least one of the windows includes a lens for optically coupling between outside the cap and the corresponding optical port.

7. The package of claim 1, wherein the cap comprises a metal.

8. The package of claim 1, wherein the electro-optic device is supported by a submount on a spacer block.

9. The package of claim 8, wherein the submount has metal leads for providing electrical connection to the electro-optic device.

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10. The package of claim 1, wherein the substrate further comprises:

a first via hole located within a portion of the substrate enclosed by the cap, the first via hole having a first end and a second end, the first end for making electrical contact with the electro-optic device.

11. The package of claim 10, wherein the substrate further comprises:

a second via hole located within a portion of the substrate not enclosed by the cap, the second via hole having a first end and a second end, the second end of the second via hole electrically coupled to the second end of the first via hole.

12. The package of claim 11, wherein the substrate further comprises:

a mounting plate supporting the substrate and electrically coupling the second end of the first via hole with the second end of the second via hole.

13. The package of claim 1, further comprising a housing surrounding the substrate.

14. The package of claim 13, wherein the housing comprises a lid and a bottom portion for supporting the substrate.

15. The package of claim 13, wherein the housing comprises a plastic material.

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16. The package of claim 1, wherein the electro-optic device comprises a semiconductor optical amplifier.

17. The package of claim 1, wherein the substrate comprises a multi-layer ceramic substrate.

18. The package of claim 1, wherein the substrate comprises a ceramic substrate.

19. The package of claim 18, further comprising:

a thermo-electric cooler, wherein the ceramic substrate functions as a cool plate of the thermo-electric cooler.

20. The package of claim 19, further comprising a plurality of semiconductor elements connected in series between the cool plate and a warm plate of the thermo-electric cooler.

21. The package of claim 1, further comprising:

a thermo-electric cooler having a cool plate and a warm plate, wherein the cool plate is in thermal contact with the substrate and the warm plate serves as a mounting plate for the package.

22. The package of claim 21, further comprising a plurality of semiconductor elements connected in series between the cool plate and the warm plate.

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23. A package for an optical device comprising:

a substrate having a top surface and a recessed area;

an optical device mounted in the recessed area; and

a window covering the recessed area, the window forming a hermetic seal for the optical device.

24. The package of claim 23, further comprising:

means for redirecting an optical signal between an optical path located along the top surface and the optical device mounted in the recessed area.

25. The package of claim 24, wherein the means for redirecting an optical signal comprises a plurality of reflective devices.

26. The package of claim 25, wherein the reflective devices are mirrors.

27. The package of claim 24, wherein the means for redirecting an optical signal comprises a plurality of devices selected from the group consisting of refractive devices, diffractive devices, waveguides, couplers, and combinations thereof.

28. The package of claim 23, wherein the optical device comprises a semiconductor optical amplifier.

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29. The package of claim 23, wherein the optical device comprises a photodetector.

30. The package of claim 29, further comprising a partially reflective device that taps a portion of light from an optical path located along the top surface so that the portion of light is redirected to the photodetector.

31. The package of claim 23, further comprising:

a first reflective device for redirecting light from a first optical path located along the top surface to the recessed area;

a second reflective device in the recessed area for redirecting light from the first reflective device to an optical input of the optical device;

a third reflective device in the recessed area for redirecting light from an output of the optical device to the top surface; and

a fourth reflective device for redirecting light from the third reflective device along a second optical path located along the top surface.

32. The package of claim 23, wherein:

the substrate includes multiple layers; and

one or more of the layers have holes that form the recessed area.

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